AMENDMENTS TO THE SPECIFICATION

[Para 18] ~~Figs. 23-24 are flow charts representing an algorithm for optimizing gas lift performance of a well.~~

[Para 87] ~~Referring generally to Figure 23, the general methodology is illustrated in flow chart form.~~ Initially, a flow rate of the produced fluid is determined based on one or more wellbore parameters ~~(see block 198)~~. Subsequently, an analysis is performed as to whether the flow rate is in an optimal range ~~(see block 200)~~. In this embodiment, the analysis is performed automatically via, for example, processor 22. The optimal range can be determined in a variety of ways, including use of data from similar wells, use of historical data from the well being analyzed or by adjusting the gas injection rate and tracking whether the production fluid flow rate is increasing or decreasing. If the processor determines the flow rate is not optimized, an action is taken, e.g. changing the gas injection rate, to adjust the flow rate ~~(see block 202)~~. Following adjustment, the new fluid flow rate is again determined ~~(see block 198)~~ and the process is repeated.

[Para 88] As discussed above with reference to Figures 19-22, the flow rate of fluid produced through production tubing 16 can be obtained from temperatures measured along the wellbore. ~~As illustrated in Figure 24, the~~ <u>The</u> fluid flow rate is modeled via a specific well model/algorithm that relates temperature to the production fluid flow rate through tubing 16 ~~(see block 204)~~. After establishing the suitable model, temperatures are measured along the well ~~(see block 206)~~. A distributed temperature sensor, such as the distributed temperature sensor 20 discussed above, works well to obtain a temperature profile that can

automatically be provided to processor 22. The measured temperatures are applied to the well model ~~(see block 208)~~ which uses those measured temperatures to determine a fluid flow rate of the production fluid ~~(see block 210)~~. In this embodiment, however, the model/algorithm is expanded to automatically optimize that fluid flow rate.

[Para 89] Processor 22 can be used in a closed loop feedback system to facilitate this flow rate optimization by continually analyzing whether the flow rate is within a determined optimal range. Specifically, upon determining a fluid flow rate, the algorithm performs a first test ~~212~~ and checks to see if the fluid flow rate through the production tubing is too fast, e.g. above the optimal range. If the flow rate is too fast, processor 22 acts to decrease the fluid flow rate ~~(see block 214)~~ by, for example, decreasing the flow of injection gas. The process ~~is~~ then ~~returned to block 206 to~~ once again measures temperatures along the well for determining the new flow rate. If, however, the first test ~~212~~ does not detect a fluid flow that is too fast, a second test ~~216~~ checks to see if the flow rate is too slow. If the flow rate is too slow, processor 22 acts to increase the fluid flow rate ~~(see block 218)~~ by, for example, increasing the gas injected. The process ~~is~~ then ~~returned to block 206 to~~ again measures temperatures along the well for determining the new flow rate. When the second test ~~216~~ is performed and the fluid flow rate in the production tubing is not too slow, then the flow rate is in the optimal range and the process returns ~~is returned to block 206~~ for subsequent checking of the fluid flow rate. Thus, use of the algorithms discussed above can be automated to continually check and optimize the production fluid flow rate.